



EFFECT OF AGE OF THE ROOTSTOCK ON THE SUCCESS OF SOFTWOOD GRAFTING IN JACK (*ARTOCARPUS HETEROPHYLLUS* LAM.)

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Abstract

An investigation was carried out to standardize the age of the rootstock on success of softwood grafting in jack. This experiment was laid out in a randomized block design, replicated thrice with seven treatments consisting of different age of the rootstocks (1-7 months old). The aim of this study is to find out suitable age of the rootstock for the success of softwood grafting. The results of the experiment revealed that four months old rootstocks recorded the maximum values for the characters *viz.*, graft success and graft survival percentage, days taken for first and last sprouting, number of sprouts, sprouting percentage, number of leaves, leaf area, plant height and stem girth which was followed by five months old rootstocks.

Key words : Jack, propagation, age of the rootstock.

Introduction

Jack fruit (*Artocarpus heterophyllus* Lam.) belongs to the family Moraceae. It is indigenous to India and bears the largest fruit among the edible fruit and is quite a heavy yielder. Being a staple food, it is very popular among the poor classes and house wives for culinary preparation and it is known as the poor man's food in the eastern and southern parts of India. The ripe fruit has high nutritive value and contain minerals, vitamin A and C. It is used for preparation of pickles, dehydrated leather, thin papads, canned fruits and nectar from the pulp. Jack fruit tree is widely grown in southern states *viz.*, Kerala, Tamil Nadu, Karnataka and Andhra Pradesh. The total area under jackfruit cultivation in India is around 32,600 ha. In Tamil Nadu, it is grown in an area of about 1.882 ha. The tree can provide environmental services. It is highly wind tolerant and therefore makes a good component in a windbreak or border planting. Growing in pastures, it can provide fallen fruit for livestock, shade and long term timber. In home gardens, the dense jackfruit canopy can provide and a visual screen and is very ornamental. The significance of vegetative propagation for the maintenance of genetic uniformity and preservation of identity of a clone or cultivar is well recognized in horticultural crops. Amin (1978) developed softwood grafting in mango at the Anand Campus of Gujarat

Agricultural University and it has very good success in the drier tracts of Gujarat State. This method of grafting would be useful even in jack, for rootstocks raised in polythene container with suitable media. Hence, an investigation was conducted to evaluate the effect of age of the rootstock on the success of softwood grafting in jack.

Materials and Methods

The experiment was conducted in the Department of Horticulture, Faculty of Agriculture, Annamalai University during 2013-2015. The experiment was conducted in the randomized block design with three replication. The rootstock was collected from uniformly, vigorously growing seedling of different age (1-7 months) were used as rootstocks for soft wood grafting. The scion from healthy and high yielding mother plants of *cv.* PLR-1 was used. The selected scion with pencil thickness, free from pest and diseases were selected for softwood grafting. Scion shoots were collected directly from selected healthy jack fruit trees after pre curing for a week in the morning hours from 7.30 to 8.30 am on the day of grafting. The scion shoots were separated from the selected tree with sharp secature and were wrapped in moist cloth and carried in plastic bucket to the site of grafting. The scions collected were kept in water to get rid of the white latex. The scions separated were grafted

Table 1 : Effect of age of the rootstock on graft success, survival percentage number of leaves and leaf area in jack.

Treatments (Age of rootstock)	Graft success %	Graft survival %	No. of leaves	Leaf area (cm ²)
T ₁ (1 Month)	48.78 (44.20)	59.89 (50.49)	2.87	48.98
T ₂ (2 Months)	50.44 (45.25)	60.00 (55.15)	4.67	62.88
T ₃ (3 Months)	68.00 (55.78)	82.84 (64.98)	6.58	63.45
T ₄ (4 Months)	82.09 (63.89)	95.45 (76.26)	10.53	68.45
T ₅ (5 Months)	80.45 (65.29)	93.23 (75.13)	9.03	66.51
T ₆ (6 Months)	76.50 (60.90)	89.09 (70.96)	8.78	65.87
T ₇ (7 Months)	69.14 (56.42)	85.53 (67.67)	7.89	64.67
S.Ed.	0.79	1.05	0.74	0.83
CD (P=0.05)	1.59	2.10	1.48	1.67

Values in parentheses are arc sin transformed.

on the same day. For softwood grafting method, the top growth on the rootstock was decapitated with the help of a knife. The girth of rootstock in that region is almost equal to that of the scion. After this, a longitudinal cut of 4 to 5 cm length was given on the terminal trimmed rootstock. The top of the rootstock appeared like the letter V. A scion of about the same thickness as that of the rootstock was selected. The length of the scion was about 10 cm. The lower end of scion was cut into gently sloping wedge of about 5 cm by removing the bark and a little wood from the two opposite sides. Care was taken to retain some bark on the remaining two sides. The wedge shaped scion thus prepared was inserted into the V shaped slit of the stock and secured film with 1.5 cm wide and 45cm long, 200 gauge white transparent polythene strip. The scions were covered with small transparent polybags to avoid desiccation of the scion, by creating humidity near and above the union region. Soon after grafting, grafted plants were transferred to shade net house for one week and later the same were shifted to green house.

Results and Discussion

The data pertaining to Graft success, survival percentage, number of leaves and leaf area (cm²) was presented in table 1. The maximum graft success was recorded in four months old rootstock (82.09%) and it was followed by five months old rootstock (80.45%). The lowest success percentage was observed in one month old rootstock (48.78%). The maximum survival percentage was recorded in four months old rootstock (95.45%) and it was followed by five months old rootstock (93.23%). The lowest success was observed in one month old rootstock (59.89%). Reddy and Melanta (1988)

reported that three months old rootstocks recorded a maximum graft union success followed by four month old rootstocks in mango. Phadnis (1971) in cashew recorded a maximum success in softwood grafting with rootstocks less than five months age. Similar results were recorded in cashew by Nagabhushanam and Rao (1978); Muniswami (1979). The reason might be due to the fact that, the optimum thickness of the rootstocks influenced the graft union formation satisfactorily. Similar results were obtained by Sulikeri and Rao (1999), when grafting was done in four to six months old rootstock in mango. The age of rootstocks has relationship with regenerating ability of a plant part, which is found in younger rootstocks and this is because of higher activity of meristematic cells resulting in faster formation of callus and quick healing of grafting union. In general the lower graft union success could be attributed to the lack of intimate contact of cambial region of both stock and scion and to interference of exudation of latex (Hartman *et al.*, 1986). The maximum number of leaves was obtained in four months old rootstock (10.53) and minimum number of leaves was (2.87) obtained in one month old root stock. Similarly data related to number of leaves of grafts as influenced by height and thickness of stocks due to the physiological maturity of rootstock which play an important role in the number of leaves. According to Zimmerman (1958) maximum number of leaves were recorded in four to six months old rootstocks and it was due to younger stocks store more carbohydrates and other food substances and this leads to more vegetative growth in terms of number of leaves. These results are in confirmatory with Reddy (1986), who reported that maximum number of leaves on graft prepared on three months old rootstock in mango and Yogananda (1989) reported maximum leaves were

produced on four months old rootstock used for softwood grafting in cashew.

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